

In the Abstract:

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-- ABSTRACT

A mediated electrochemical oxidation process and apparatus for the use of mediated electrochemical oxidation for the oxidation, conversion/recovery, and decontamination of inorganic solids, liquids, and gases where higher oxidation states exist. Inorganic materials are introduced into an apparatus for contacting the inorganic materials with an electrolyte containing the oxidized form of one or more reversible redox couples, at least one of which is produced electrochemically by anodic oxidation at the anode of an electrochemical cell. The oxidized forms of any other redox couples present are produced either by similar anodic oxidation or reaction with the oxidized form of other redox couples present and capable of affecting the required redox reaction. The oxidized species of the redox couples oxidize the inorganic waste molecules and are converted to their reduced form, whereupon they are reoxidized by either of the aforementioned mechanisms and the redox cycle continues. --